

Appl. No. 10/523,666
Amdt. Dated September 18, 2006
Reply to Office Action of June 16, 2006

Listing of Claims:

1. (currently amended) A control unit controlling a threshold voltage of a circuit unit having a plurality of transistor devices, comprising
 - a reference circuit;
 - a measuring unit measuring a threshold voltage of at least one sensing transistor of the circuit unit and measuring a reference threshold voltage of at least one reference transistor of the reference circuit;
 - a differential voltage generator generating a differential voltage from outputs of the measuring unit, the voltage generator comprising an averaging unit, a comparing unit and an amplifier, and
 - a bulk connection of the transistor devices in the circuit unit to which the differential voltage is fed as a biasing voltage.
2. (currently amended) The control unit of claim 1, wherein the differential voltage generator comprises:
 - an averaging unit forming forms at least one average threshold voltage value of at least one measured transistor threshold voltage of the circuit unit;
 - an comparing unit comparing compares at least one average threshold voltage value of the circuit unit with at least one measured transistor threshold voltage of the reference circuit and creating at least one difference voltage value indicating the

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difference between at least one average threshold voltage value of the circuit unit and at least one transistor threshold voltage of the reference circuit; and

an the amplifier unit amplifying amplifies at least one difference voltage value of the comparing unit and creating at least one amplified difference voltage value.

3. (original) The control unit of claim 2, wherein the amplifier unit is a high gain amplifier.

4. (original) The control unit of claim 1, wherein the reference circuit comprises at least one reference transistor in at least one comparator amplifier.

5. (original) The control unit of claim 4, wherein the reference transistor is provided in a separate well of the chip comprising the circuit unit.

6. (original) The control unit of claim 4, wherein the reference transistor is controlled separately from the transistor devices of the circuit unit by a reference voltage.

7. (original) The control unit of claim 1, wherein the measuring unit comprises at least one sensing transistor sensing the threshold voltage.

8. (original) The control unit of claim 8, wherein the sensing transistor is controlled separately from the reference transistor by a sensing voltage.

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9. (original) The control unit of claim 1, wherein the circuit unit comprises a plurality of transistor devices, and wherein a first sub-plurality of the transistor devices is employed as reference transistors and a second sub-plurality of the transistor devices is employed as sensing transistors, and wherein the differential output of the differential voltage generator is fed as a biasing voltage to the bulk of the plurality of transistor devices.

10. (original) An integrated circuit (IC) device comprising a circuit unit and a control unit according to claim 1.

11. (currently amended) A method for controlling of at least one threshold voltage of transistors in a circuit unit comprising:

measuring at least one transistor threshold voltage of the circuit unit;

providing at least one reference transistor and measuring a threshold voltage of the at least one reference transistor;

generating a differential voltage from outputs of the measuring unit
comprising the steps of:

forming at least one average threshold voltage value of at least one measured transistor threshold voltage of the circuit unit;

comparing at least one average threshold voltage value of the circuit unit with at least one measured transistor threshold voltage of the reference circuit and creating at least one difference voltage representing the difference between at least one average threshold voltage value of the circuit unit and at least one transistor threshold voltage of at least one reference transistor; and

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amplifying the at least one difference voltage of the comparing unit and
creating at least one amplified difference voltage,
and

feeding the differential voltage as a biasing voltage to a bulk connection of
the transistor devices in the circuit unit.

12. (cancelled)

13. (previously amended) The method of claim 11, wherein

a plurality of transistor devices is divided up into a first sub-plurality of
reference transistors and a second sub-plurality of sensing transistors and wherein
the transistor threshold voltage of the first sub-plurality is measured as
reference voltage;

the threshold voltage of the second sub-plurality is measured as sensing
voltage;

a differential voltage is generated from the reference voltage and the
sensing voltage and wherein

the differential voltage is input to the bulk of the plurality of transistor
devices.

14. (original) The method of claim 11, wherein the controlling of at least one threshold
voltage of transistors in a circuit unit is done in a closed loop.

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15. (original) The method of claim 14, wherein the controlling in the closed loop includes a controlling of a power supply.

16. (currently amended) The method of claim 12 11, wherein the amplified average voltage is negatively fed back to the circuit unit for reducing the threshold voltage difference between the circuit unit and the reference circuit.

17. (original) The method of claim 11, wherein the threshold voltage is directly measured.